

CLAIMS:

1. Display apparatus (1), comprising:
 - an electrophoretic medium (5) comprising charged particles (6) in a fluid;
 - a plurality of picture elements (2);
 - said charged particles (6) being able to occupy a plurality of positions, two of said
 - 5 positions being extreme positions and at least one position being an intermediate
 - position between the two extreme positions; and
 - drive means arranged to supply a sequence of picture potential differences (20) to
 - each of said picture elements (2) so as to cause said charged particles (6) to occupy
 - one of said positions for displaying an image; wherein said sequence of picture
 - 10 potential differences (20) form a driving waveform for causing said charged particles
 - (6) to move cyclically between said extreme positions in a single optical path and
 - effect a desired optical transition along said optical path, said picture potential
 - differences (20) being preceded by one or more shaking pulses (10).
- 15 2. Display apparatus (1) according to claim 1, comprising:
a first (3) and a second electrode (4) associated with each picture element (2) for receiving
the sequence of picture potential differences (20), the extreme positions being substantially
adjacent said electrodes (3, 4) and the intermediate position being between said electrodes (3,
4).
- 20 3. Display apparatus (1) according to claim 1 or 2, having at least two
intermediate positions.
4. Display apparatus (1) according to claim 1 or claim 2, wherein the picture
- 25 potential differences (20) are preceded by at least two shaking pulses (10).
5. Display apparatus (1) according to claim 4, wherein the picture potential
differences (20) are preceded by four or more shaking pulses (10).

6. Display apparatus (1) according to any one of claims 1 to 5, wherein the length of the or each shaking pulse (20) is of an order of magnitude shorter than a minimum time period required to drive the optical state of the apparatus from one of said extreme positions to the other.

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7. Display apparatus (1) according to any one of claims 1 to 6, wherein the energy value (defined as the integration of voltage pulse with time) of the or each shaking pulse is sufficient to release the particles at one of the extreme positions but insufficient to move the particles from one of the extreme positions to the other.

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8. Display apparatus (1) according to any one of claims 1 to 7, wherein said driving waveform is pulse width modulated.

9. Display apparatus (1) according to any one of claims 1 to 7, wherein said driving waveform is voltage modulated.

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10. Display apparatus (1) according to any one of claims 1 to 9, wherein said driving waveform is substantially dc-balanced on average (over a relatively long term).

20 11. A method of driving a display apparatus (1), comprising an electrophoretic medium (5) comprising charged particles (6) in a fluid, a plurality of picture elements (2), said charged particles (6) being able to occupy a plurality of positions, two of said positions being extreme positions and at least one position being an intermediate position between the two extreme positions; and drive means arranged to supply a sequence of picture potential differences (20) to each of said picture elements so as to cause said charged particles (6) to occupy one of said positions for displaying an image; the method comprising generating the sequence of picture potential differences (20) in the form of a driving waveform for causing said charged particles (6) to move cyclically between said extreme positions in a single optical path and effect a desired optical transition along said optical path, and providing one or more shaking pulses (10) prior to each of said picture potential differences (20).

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12. Drive means for driving a display apparatus (1) according to any one of claims 1 to 10, said drive means being arranged to supply the sequence of picture potential differences (20) to each of said picture elements (2) so as to cause said charged particles to

occupy one of said positions for displaying an image; wherein said sequence of picture potential differences (20) form a driving waveform for causing said charged particles (6) to move cyclically between said extreme positions in a single optical path, said picture potential differences (20) being preceded by one or more shaking pulses (10).